VLASOV, A. D.

VLASOV, A. D.

М. Б. Голант,
А. С. Тагер

О механизме работы параметрических усилителей СВЧ, в которых используются потоки свободных электронов.

В. О. Савеев

О предельных параметрах мощных электронных приборов миллиметрового диапазона.

9 июня

(с 18 до 22 часов)

А. Д. Власов

О методе граничной частоты в теории электронных пучков.

Г. А. Зайтленок

О взаимодействии электронного потока с электрическим полем.

М. Б. Голант

Метод расчета параметров электронно-лучевых СВЧ генераторов [illegible] типа.

Л. Н. Лошаков,
Ю. Н. Пчельников

Об определении коэффициента усиления для постоянных распространения в замедляющей системе при наличии электронного пучка.

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А. В. Гапонов

Взаимодействие электромагнитных волн с непрямолинейными электронными потоками.

10 июня

(с 10 до 16 часов)

А. Н. Терещенко,
В. А. Коробкин

О возможности улучшения параметров резонаторной системы магнетрона посредством изменения формы резонаторов.

М. Н. Кузнецов,
Л. В. Ралигин

К вопросу о механизме флюктуаций в магнетроне

М. Н. Кузнецов,
М. Н. Барбасов,
А. Е. Исаков

Экспериментальные исследования флюктуаций в магнетроне.

В. М. Бойков,
Я. Н. Шестопалов,
В. В. Конев

Малогабаритный траектограф для решения уравнений движения заряженных частиц в электрическом и магнитном полях

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Report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORIE), Moscow, 8-12 June 1959

Kozlov, A.A.

PHASE I BOOK EXPLOITATION SOV/3556

Moscow. Inzhenerno-fizicheskiy institut

Nekotoryye voprosy eksperimental'noy fiziki; [sbornik] vyp. 2 (Some Problems in Experimental Physics; Collection of Articles. Nr. 2) Moscow, Atomizdat, 1959. 123 p. 3,200 copies printed.

Sponsoring Agency: RSFSR. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya.

Ed.: B.N. Stepanov, Doctor of Physical and Mathematical Sciences, Professor; Tech. Ed.: S.M. Popova.

PURPOSE: This collection of articles is intended for graduate engineers and physicists engaged in the design of physics (laboratory) apparatus, and automatic and telemechanic equipment.

COVERAGE: This collection of articles on experimental physics was written by members of the Moscow Physics and Engineering Institute. Each article is accompanied by drawings and references.

SOV/109-59-4-2-18/27

AUTHOR: Vlasov, A.D.

TITLE: Longitudinal Motion of Electrons and the Tolerances in a Linear Accelerator (Prodol'noye dvizheniye elektronov i dopuski v lineynom uskoritele)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 2, pp 295-302 (USSR)

ABSTRACT: The accelerator considered operates with travelling waves at a wavelength of 10 cm. The device is divided into sections and consists of a cylindrical disc-loaded waveguide. First the energy spectrum and the injection conditions are considered. The longitudinal motion of a particle carrying a charge e and having a velocity $v = \beta c$ (where c is the velocity of light) in the field of the travelling wave, having an amplitude E and a phase velocity $v_{\Phi} = \beta_{0}c$, is described by:

$$d\varepsilon = eE \cos \varphi \, dz,$$

$$\frac{d\varphi}{dz} = \frac{2\pi}{\lambda}\left(\frac{1}{\beta_0} - \frac{1}{\beta}\right) = \frac{2\pi}{\lambda}\left(\frac{1}{\beta_0} - \frac{\varepsilon}{\sqrt{\varepsilon^2 - \varepsilon_0^2}}\right) \qquad (1)$$

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where ε is the energy of the particle, ε_0 is the rest energy of the particle, λ is the wavelength, z is the longitudinal co-ordinate and φ is the phase of the particle. By integrating Eq (1), an expression in the form of Eq (2) is obtained, where Φ is a constant depending on the initial conditions. When the phase velocity of the travelling wave is equal to the velocity of light, Eq (2) can be written as Eq (3). This is used to plot the phase trajectories of the particles for $A = 0.625$, $\beta_0 = 1$, $\beta_0 = 1 \pm 5 \times 10^{-5}$ and for various values of Φ. The injection conditions for the system can be expressed by Eq (6) where the values of E_H, A_H and ε_H refer to the conditions at the input of a section of the waveguide. The dependence of the output energy on the injection conditions can be found by determining the second integral of Eq (1). When $\beta_0 = 1$, the output energy is expressed by Eq (7), where $\bar{E}$ denotes the average value of the electric field. The energy spectrum at the output can be expressed by Eq (8), where the summation is taken over all the values of the function φ_H.

The dependence of the spectral density on the output energy is illustrated in Fig 2. From the above formulae it is concluded that by means of the accelerator it is possible to obtain comparatively narrow spectra. It is shown that at the wavelength of 10 cm and $A_H = 0.625$, the spread of the output energies does not exceed 1% for more than two-thirds of the total number of the injected particles. However, the errors in the dimensions and the operating parameters of the accelerator lead to a reduction in the energy of the accelerated particles. It is, therefore, of interest to determine the reduction in the output energy due to the changes of the phase velocity of the accelerating wave, temperature and the dimensions of the waveguide. In analysing this problem it is assumed that the phase velocity can be written as $v_\Phi = (\beta_0 + \beta_\sim)c$. The phase velocities of the higher harmonics of the accelerating field can be expressed approximately as $v_{\Phi n} = nc$. The changes of the amplitude of the accelerating field can be expressed by a

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Longitudinal Motion of Electrons and the Tolerances in a Linear Accelerator

coefficient ($1 + \rho_{\sim}$). Consequently, Eq (1) are written as Eq (10) and (11). Partial solutions of these equations are found and it is shown that these can be employed to determine the tolerances of the accelerator for the prescribed values of the phase velocity error and the reduction of the output energy. The application of these formulae is illustrated by a numerical example. The author expresses his gratitude to E.L.Burshteyn for his valuable remarks. There are 2 figures and 8 references of which 3 are Soviet and 5 English.

SUBMITTED: 16th May 1957

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66361
SOV/120-59-5-4/46

21.2100

AUTHORS: Burshteyn, E. L. and Vlasov, A.D.

TITLE: Design of a Klystron Buncher for an Electron Linear Accelerator

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5, pp 26-28 (USSR)

ABSTRACT: It is well known that the energy resolution of electrons accelerated by a linear accelerator can be improved by using preliminary wave-guide or klystron bunchers. The present paper is concerned with the choice of the optimum characteristics of klystron bunchers. Consider an electron which leaves the injector with a kinetic energy W_i and enters the gap of the buncher with a phase Θ. After passing through the gap the energy of the electron will be $W = W_i(1 - m \sin \Theta)$, where U is the amplitude of the voltage applied to the gap, $m = eU/W_i$ is the energy modulation coefficient and the phase φ of the electron relative to the accelerating wave at the input of the accelerator is given by $\varphi = \Theta - A \sin \Theta$. It follows that the relation between the energy W_H and the phase φ_H at the input into the

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accelerator is given by Eq (1) and this is shown by curve 1 in Fig 1. The quantity A is the so-called bunching parameter and is given by Eq (2), where ℓ is the distance from the buncher gap to the input of the accelerator, W_o is the electron rest energy and λ is the wave length. In the case of a linear accelerator with a constant phase velocity c and a constant amplitude E_m of the accelerating field, the electron energy W and phase φ is given by Eq (3), where $\alpha = eE_m \lambda/W_o$ and θ are the limiting values of the phase φ. Eq (3) is only approximate but may be used by assuming that E_m is the field amplitude at the input to the accelerator. Curves 2 in Fig 1 represent lower parts of the phase trajectories for different initial values of φ_H and W_H. It is assumed that the accelerator is sufficiently long so that the relative spread in the output energies is determined by the spread in the values of Φ. The relative spread of output energies does not exceed $q(q \ll 1)$ for those particles for which $1-q \leqslant |\sin \Phi| \leqslant 1$,

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i.e. for those points on curve 1 in Fig 1 which lie between the phase trajectories 2a and 2b which correspond to $\cos\Phi \approx \pm\sqrt{2q}$. The problem is then reduced to the determination of the buncher parameters and the value of the injection energy for which a maximum number of particles is found between these two limiting phase trajectories. Formulae are derived which may be used to achieve this.
There are 1 figure and 2 references, 1 of which is Soviet and 1 English.

SUBMITTED: August 4, 1958

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77778
SOV/109-5-2-11/26

9.1300

AUTHOR: Vlasov, A. D.

TITLE: On Brillouin's Electron Flows and Boundary Particle Conception

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 2, pp 264-268 (USSR)

ABSTRACT: The stability of electron beams, calculated on the assumption of the presence of boundary particles and laminar movement of electrons is analyzed. It is shown that this widely accepted approach does not always give correct answers, and in many cases leads to beams of unstable structure. The analysis of electron beams with a considerable space charge, and focused by longitudinal magnetic field, is usually based on the assumption of the presence of boundary particles, and the equation of motion of the electron located on the outer surface of the beam is solved. The trajectories of the inner electrons are assumed to follow the outer electron

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trajectory (laminar flow). The concept of the boundary particle is the basis of the known flows of Brillouin (see U.S. reference at end of abstract), and is widely accepted by scientists. While most of the investigations are concerned with the equilibrium conditions in the electron flow, it is necessary also to insure the stability of the equilibrated beam structure. A cylindrical coordinate system r, , z, the z-axis coinciding with the axis of the symmetrical beam is used. A longitudinal magnetic field B_z, axially symmetrical, focuses the beam. The radius changes along the z-axis are slow. Under these conditions the radial movement of the electron in the beam is described by Eq. (1).

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$$\frac{d}{dt}(m\dot{r}) + \frac{e^2B_z^2}{4m}r - P_r = \frac{e^2}{4m}\left(B_z - \frac{2m}{e}\dot{\theta}\right)_0^2 \frac{r_0^4}{r^3}. \qquad (1)$$

Here $m = m_0/\sqrt{1 - \beta^2}$; m_0 - rest mass of the electron; e - electron charge; $\beta = v/c$ - ratio of electron velocity to light velocity; t - time; P_r - radial force due to the space charge of the electron beam; index "o" denotes initial conditions of the variables. $I(r, r_\Gamma)$ - current through section with radius r. The charge of the beam induces an electric and a magnetic field with components

$$E_r = \frac{I(r, r_\Gamma)}{2\pi\varepsilon_0 v_z r}, \quad B_\theta = \frac{I(r, r_\Gamma)}{2\pi\varepsilon_0 c^2 r}.$$

Therefore

$$P_r = -e(E_r - v_z B_\theta) = \frac{e(1 - \beta_z^2)}{2\pi\varepsilon_0 v_z} \frac{I(r, r_\Gamma)}{r}.$$

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This expression is substituted into (1), the variable $\rho = r\sqrt{\frac{m}{mo}}$ is introduced and the slow change of m is taken into consideration for transforming (1) into

$$\frac{d^2\rho}{dt^2} + A\rho = \frac{BI(\rho, \rho_r)}{\rho} + \frac{C\rho_0^4}{\rho^3}, \qquad (2)$$

where

$$A = \frac{e^2B_z^2}{4m^2}, \quad B = \frac{e(1-\beta_z^2)}{2\pi\varepsilon_0 m_0 v_z}, \quad C = \left(\frac{eB_z}{2m} - \dot{\theta}\right)_0^2. \qquad (3)$$

If electrons are present which are on the outside of the beam the whole time ($\rho = \rho_\Gamma$) the movement of each is described by the equation

$$\frac{d^2\rho_r}{dt^2} + A\rho_r = \frac{BI}{\rho_r} + \frac{C\rho_{r0}^4}{\rho_r^3}. \qquad (4)$$

Here I = I (ρ_Γ , ρ_Γ) - full current of the beam. The current density through the section of the beam,

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the longitudinal velocity v_z and coefficients A, B, C are assumed to be equal for all particles. As shown by (3) $BI > 0$, $C \geqslant 0$. Equation (4) proves that a radially limited beam is possible only for $A > 0$, for which condition, as proved by C. C. Wang (U.S. reference), the solution of the boundary particle equation is a periodic positive function with a period T

$$\rho_r = \rho_r(t) = \rho_r(t+T), \tag{5}$$

fluctuating around the equilibrated value of radius ρ_1, which is determined by the biquadratic equation

$$A\rho_1^4 = BI\rho_1^2 + C\rho_{r0}^4. \tag{6}$$

Equation (6) is derived from (4) for ρ_r = const. Since certain deviations from the assumed conditions are inevitable, it is necessary to consid[er] the general solution of Eq. (2), depending on two arbitrary constants. For stabili[ty] of the beam structure it is required that the small deviations of the initial

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conditions lead only to limited deviations of the particle trajectories from the assumed. The case when $C = 0$ is investigated, which takes place, e.g., when $B_{zo} = 0$ and $\vartheta_0 = 0$, the cathode is shielded from the focusing magnetic field, and the electrons leave the cathode with zero azimuthal velocities. Equation (2) becomes linear

$$\frac{d^2\rho}{dt^2} + \left(A - \frac{BI}{\rho_\Gamma^2}\right)\rho = 0, \tag{7}$$

but the needed focusing field (for given BI, ρ_1) - minimum; $B_z = B_{z\,min} = 2m\sqrt{BI/e\rho_1}$ (see (6) and (3)). The general solution of (7) is

$$\rho(t) = C_1\rho_\Gamma + C_2\rho_{II}, \tag{8}$$

where $\rho_{II} = \rho_{II}(t)$ - second particular solution of (7), linearly independent of ρ_Γ (5). Nominally the trajectories of inner particles are considered as being similar to the trajectory of the outer particle (5),

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i.e., it is $C_2 = 0$ and $0 \leqslant C_1 \leqslant 1$, and the initial conditions for each particle should satisfy the proportion

$$\frac{\dot\rho_0}{\rho_0} = \frac{\dot\rho_{\Gamma 0}}{\rho_{\Gamma 0}}. \qquad (9)$$

Equation (7) has a periodic and positive partial solution ρ_Γ per (5), but the second partial solution ρ_{II} increases without limit with time in the form $t\varphi(t)$, where φ is a periodic function with period T. Therefore, the electron beam as calculated on the basis of boundary particle conditions is not stable and disintegrates at very small deviations from (9), because divergent trajectories (8) appear. This applies also to Brillouin's flow, which is unstable. Another assumed condition is C = 0, for which the inner trajectories equation is

$$\frac{d^2\rho}{dt^2} + \left(A - \frac{BI}{\rho_\Gamma^2}\right)\rho = \frac{C\rho_{\Gamma 0}^4}{\rho^3}. \qquad (10)$$

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Inner trajectories, similar to the boundary particle trajectory (5), satisfy this equation

$$\rho(t) = \frac{\rho_0}{\rho_{r0}} \rho_r(t). \qquad (11)$$

Contrary to the above mentioned case of C = 0 the structure is stable with relation to the deviations from the initial conditions. The general solution of (10) is

$$\rho = \sqrt{\rho_I^2 + C\rho_{II}^2}, \qquad (12)$$

where $\rho_{I,II}(t)$ - two linear independent solutions of (7). One of solutions (12) can be periodic when solutions $\rho_{I,II}$ of (7) are within the stability limits. Analysis of the divergent beam for C = 0 and $A \leqslant 0$ confirms the stability structure assuming presence of boundary particles. Solution of the boundary equation (4) is aperiodic and first diminishes for $\rho_{r0} < 0$, and after reaching the minimum increases without limit.

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There is no contraction of beam for $\rho_{ro} \geqslant 0$. Under certain conditions the disintegrated beam is transformed into a stable beam of different structure, if the length of the focus structure is adequate, but this case is not the object of the present paper. It is only noted that the focusing field must in this case exceed $B_{z\ min}$ by a certain margin. The conclusion is drawn that the assumption of the presence of boundary particles and laminar movement of electrons in the beam does not always lead to correct results. Generally speaking, in a stable electron beam the outside particles do not follow the outside surface of the beam, which can only be considered as the envelope. There are 12 references, 5 Soviet, 6 U.S., 1 German. The U.S. references are: L. Brillouin, Phys. Rev., 1945, 67, 260; C. C. Wang, Proc. IRE., 1955, 38, 135; J. T. Mendel, Proc. IRE., 1955, 43, 3, 327; J. T. Mendel, C. F. Quate, W. H. Vocom, Proc. IRE., 1954, 42, 5, 800; A. M. Clogston, H. Heffner, J. Appl. Phys., 1954, 25, 436; P. K. Tien, J. Appl. Phys., 1954, 25, 1281.

SUBMITTED: April 8, 1959

Card 9/9

VLASOV, A. D.

95

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo instituta (Scientific Conference of the Moscow Engineering Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fiveyskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Ryazanov, theory of ionization losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of subcritical plasma;

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Nauchnaya konferentsiya... S/089/62/013/006/019/027
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design of 30-Mev electron linear accelerator; Ye. G. Pyatnov, A. A. Glaskov, V. G. Lopato, A. I. Finogenov, G. N. Skepskiy, V. D. Seleznev, experimental characteristics of low-energy electron linear accelerators; G. A. Zeytlenk, V. M. Levin, S. I. Piskunov, V. L. Smirnov, V. K. Khokhlov, radiocircuit parameters of ЛУЭ (LUE)-type accelerators; G. A. Tyagunov, O. A. Val'dner, B. M. Gokhberg, S. I. Korshunov, V. I. Kotov, Ye. M. Moroz, accelerator classification and terminology; O. S. Milovanov, V. B. Varakein, P. R. Zenkevich, theoretical analysis of magnetron operation; A. G. Tragov, P. R. Zenkevich, calculation of attenuation in a diaphragmated waveguide; Yu. P. Lazarenko, A. V. Ryabtsev, optimum attenuation length for linear accelerator; A. A. Zhigarev, R. Ye. Yeliseyev, review on trajectographs; I. G. Morozova, G. A. Tyagunov, review on more than 500 ion sources; M. A. Abroyan, V. L. Komarov, duoplasmatron-type source; V. S. Kuznetsov, A. I. Solnyshkov, calculation and production of intense ion beams; V. M. Rybin (Ye. V. Armenskiy), inductive current transmitters of high sensitivity; V. I. Korosa, G. A. Tyagunov, kinetic description of linear acceleration of relativistic electrons; A. D. Vlasov, phase oscillations in linear accelerators; E. L. Burshteyn, G. V. Voskresenskiy, beam field effects in the waveguide of an electron linear accelerator; R. S. Bobovikov,

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L 12956-63 EWG(k)/EWT(1)/BDS/ES(w)-2 AFFTC/ASD/ESD-3/SSD Pz-4/Pab-4
IJP(C)/AT S/109/63/008/004/026/030

67

AUTHOR: Vlasov, A. D.

TITLE: On computing wave parameters of electron beams with a high density space charge

PERIOICAL: Radiotekhnika i elektronika, v. 8, no. 4, 1963, 718-720

TEXT: The author explains that modern UHF devices are largely based on the linear theory of the space charge of electron beams as developed by W. C. Hahn and S. Ramo, to whose work he refers in his bibliography. He points out, however, that a simplified modification of this theory is usually used, based on the assumption that the plasma frequency ω_p is extremely small as compared with the working frequency ω. With the increase in power of UHF devices as well as the use of tubular beams, the density of the space charge increases many times and the condition that $\omega_p \ll \omega$ is, more and more often, not fulfilled. This, the author says, is the reason for the growing discrepancy between the theoretical and experimental results in this area. In figuring wave parameters, he says, we can no longer go on the assumption that ω_p is that much smaller than ω. He then proceeds to show, mathematically, how this plasma density factor can be taken into account, with a

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On computing wave .....

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resulting precise determination of wave parameters which varies as much as 10% from values previously obtained. This, the author says, makes it possible to achieve much greater accuracy in computing other relevant parameters of the electron beam, such as electron conductivity introduced by the beam in passing through a resonator.

SUBMITTED: June 25, 1962

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L 10268-63

ACCESSION NR: AP3000571 S/0109/63/008/005/0870/0873

AUTHOR: Vlasov, A. D.

44

TITLE: Calculating the conductance due to the electron beam in a resonator

SOURCE: Radiotekhnika i elektronika, v. 8, no. 5, 1963, 870-873

TOPIC TAGS: klystron, electron-beam calculations

ABSTRACT: Shunt conductance due to the electron beam has been calculated from two different formulas described in German (A. Bers, Mikrowellenrohren, s. 53, Braunschweig, Fr. Vieweg u. Sohn, 1961) and in American (G. M. Branch, IRE Trans., 1961, ED-8, 3, 193) literature. The article clarifies the connection between the two formulas, evaluates their accuracy, and introduces improvements that permit either formula to be used for calculating tubular beams. Orig. art. has: 13 equations.

ASSOCIATION: none

SUBMITTED: 26Aug62 DATE ACQD: 30May63 ENCL: 00

SUB CODE: CO NO REF SOV: 001 OTHER: 003

Card 1/1 ja/mh

42122

S/109/62/007/010/009/012
D266/D308

9,4120

AUTHORS: Vlasov, A.D., and Belov, N.Ye.

TITLE: Quality factor of the amplifier stages and of the output circuit of a wide band klystron

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 10, 1962, 1787 - 1794

TEXT: The purpose of the paper is to discuss the design of a multi-cavity klystron resulting in an optimum gain-bandwidth factor. The optimization is carried out for two parameters Φ and Ψ, where the former is concerned with the amplifying stages and the latter solely with the output circuit. The definitions are as follows

$$\Phi = \frac{1}{Q} k \quad \text{and} \quad \Psi = \frac{1}{Q} \eta,$$

where 1/Q - 3 db bandwidth, k - gain of a single stage, η - electronic efficiency. Assuming staggering tuning but otherwise identical stages, 1/Q and k represent averaged values. The calculations are performed for an annular beam of electrons (outer radius a, and
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Quality factor of the amplifier ...

inner radius b) moving in a tunnel. The resonators are of the usual reentrant type, where R/Q is approximated by the following formula

$$\frac{R}{Q} \doteq C_2\left(\frac{2l}{d}\right)^{\varepsilon_2} \tag{8}$$

where 2l - width of the interaction gap, d - inner diameter of the drift tube, C_2, ε_2 - constants, taken in one particular case as $C_2 \simeq 110$ and $\varepsilon_2 \simeq 0.3$. Similar approximation is used for the plasma frequency reduction factor which is written in the form

$$F = C_1\rho^{\varepsilon_1} \tag{7}$$

where C_1, ε_1 - constants and ρ is the normalized mean radius, defined as

$$\rho = \frac{\omega}{v} \cdot \frac{a + b}{2} \sqrt{1 - \beta^2},$$

where ω - angular frequency, v - beam velocity, $\beta = v/c$, c - velocity of light. The gap coupling coefficient is taken as

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Qualtiy factor of the amplifier ...

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$$M = \frac{I_0(\rho)}{I_0(\xi\rho)} J_0(\alpha) \tag{9}$$

where I_0, J_0 - Bessel functions, $\xi = a/b$, $\alpha = \frac{\omega l}{v}$. Φ and Ψ are then expressed with the aid of the above parameters and means for maximizing them are investigated. There is a transit angle which optimizes both Φ and Ψ but generally only one of them can be optimized and a compromise must be sought. The optimum value of the perveance is often not realizable and then perveance must be chosen on practical considerations and the value of transit angle optimized later. No complete design is described, but the author claims that the application of the method is straightforward. There are 2 figures.

SUBMITTED: June 27, 1961

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S/089/62/013/002/008/011
B102/B104

AUTHORS: Rafal'skiy, R. P., Vlasov, ~~A. D.,~~ Kudinova, K. F.

TITLE: UO_2 synthesis by U(VI) reduction with elementary sulfur under hydrothermal conditions

PERIODICAL: Atomnaya energiya, v. 13, no. 2, 1962, 181-183

TEXT: U(VI) U(IV) reduction in uranyl sulfate solutions by sulfur vapor is described. Altogether 13 experiments were made under various conditions, and in particular with different periods of heating, at a molar ratio U:S = 1:1. The sulfur vapor pressure corresponded to the vapor saturation pressure. The heating temperatures in the autoclave were 360°C, or in 2 cases 200°C, and the heating periods varied between 1 and 72 hrs. U-concentration in the initial solution was 25, or in one case 100 g/l; pH was 2.3 (or in individual cases 0.5, 1.7, 0.8); the solution volume was 20-30 ml (3.5, 9); and the uranium concentration in the final solution was between 0.001 and 18.5 g/l. In all cases the synthesis products were studied using X-rays. It is shown that U(VI)-S interaction at 360°C during 20 hrs and more causes virtually complete uranium reduction (25 g/l

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solution volume 22 ml, pH 2.3). With heating periods of 1 and 4 hrs (360°C) (25 g/l, pH 2.3, volume of solution 21 and 9 ml) a precipitate of $UO_2 + U_3O_8$ was observed only at $t \geqslant 14$ hrs, and with 22-25 ml pure UO_2 was precipitated. At 200°C reduction proceeds more slowly is less complete. UO_2 precipitates in finely crystalline form (size 0.01 mm, lattice constant 5.45-5.46)U_3O_8, somewhat more coarsely crystalline at 200°C (0.01-0.2 mm). There are 2 figures and 1 table.

SUBMITTED: November 28, 1961

RAFAL'SKIY, R.P.; VLASOV, A.D.; NIKOL'SKAYA, I.V.

Possibility for the synchronous transport of U^{vi} and S by hydrothermal solutions (based on experimental data). Dokl. AN SSSR 151 no.2: 432-434 Jl '63. (MIRA 16:7)

1. Predstavleno akademikom D.S.Korzhinskim.
(Uranium) (Sulfur)
(Geochemistry)

BONDAREV, B.I.; VLASOV, A.D.

Self-consistent particle distribution and limit current in a linear accelerator. Atom. energ. 19 no.5:423-428 N '65.
(MIRA 18:12)

VLASOV, A.D.

Calculation of the electron conductivity and wave form of a space charge. Radiotekh. i elektron. 10 no.8:1546 Ag '65.

(MIRA 18:8)

Vlasov, Aleksandr [illegible] Technical Sciences

Theory of linear accelerators (Teoriya lineynykh uskoriteley) Moscow, Atomizdat, [illegible] Errata slip inserted 2,800 copies printed.

TOPIC TAGS: particle accelerator, high energy accelerator, linear accelerator, nu[illegible] [illegible] accelerator, ion accelerator, motion [illegible]

PURPOSE AND COVERAGE: This book contains a systematic exposition of the theory on [illegible]

[illegible]

ACCESSION NR AM5013556

intended for scientists and engineers working on the design, construction and [illegible]

TABLE OF CONTENTS (abridged):

Card 2/3

VLASOV, Aleksandr Danilovich, doktor tekhn. nauk; MOLYAN, G.L., red.

[Theory of linear accelerators] Teoriia lineinykh uskoritelei. Moskva, Atomizdat, 1965. 306 p. (MIRA 18:4)

L 15250-65 EEC(b)-2/EPA(w)-2/EWT(1)/EEC(t) Pab-10 BSD/ASD(a)-5/ESD(t)
ACCESSION NR: AP5001202 S/0109/64/009/007/1234/1245

AUTHOR: Vlasov, A. D.

TITLE: Theory of nonlaminar electron flow focussed by a magnetic field

SOURCE: Radiotekhnika i elektronika, v. 9, no. 7, 1964, 1234-1245

TOPIC TAGS: longitudinal magnetic field, particle motion, electron flow

ABSTRACT: The nonlaminar structure of an axially symmetric electron flow focussed by a longitudinal magnetic field is studied. The upper and lower limits are found for the focussing field. The well known fact that the required field is always greater than that predicted by the laminar theory of Brillouin is explained. It is shown that the flow for a screened cathode is continuous and continuous or tubular for an unscreened cathode, depending on whether or not the cathode intersects the axis of the flow. Equations are derived for particle trajectory, and the relationship between charge density distribution and particle distribution are given for various trajectories. Author expresses thanks to [illegible]. Orig. art. has: 33 formulas.

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L 15250-65
ACCESSION NR: AP5001202

ASSOCIATION: none

SUBMITTED: 22Apr63 ENCL: 00 SUB CODE: NP,EM

NO REF SOV: 002 OTHER: 006 JPRS

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L 18937-65 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pu-4 IJP(c)/AEDC(a) JD/JG/WW/ES

ACCESSION NR: AP5003162 S/0078/64/009/009/2222/2230

B

AUTHOR: Vlasov, A. D.; Rafal'skiy, R. P.

TITLE: Study of the system UO_2SO_4-S-H_2O-(SiO_2) at high temperature and pressures

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 9, 1964, 2222-2230

TOPIC TAGS: uranium, uranium compound, sulfur compound, high temperature effect, pressure effect

ABSTRACT: The authors studied the relationship of equilibrium concentrations to temperature and initial concentration for hexavalent uranium. The concentrations of uranium decrease with rising temperature: abruptly at 100-200°, and smoothly at $T > 200°$. As initial concentrations increase, the equilibrium concentrations also increase. This rise is less pronounced at high temperatures.
In the system H_2SO_4-UO_2-S-H_2O at 200°, the concentrations of uranium in solution are close to the corresponding equilibrium concentrations in the system UO_2SO_4-S-H_2O (for the same molalities of H_2SO_4 and UO_2SO_4). The identity of these systems was thus experimentally demonstrated.
Using an analysis of the relations $c = f(c_0)$, the authors set up equations for the reactions taking place in the system UO_2SO_4-S-H_2O at 100,

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ACCESSION NR: AP5003162

150, and 200°. The equilibrium constants and changes in free energy of these reactions were calculated for 150 and 200°.

The composition of the reaction products in the system UO_2SO_4-S-H_2O changes with rising temperature from S0 at 100° to polythionic acids or other high-oxygen compounds of sulfur at 360°, i.e., toward the formation of sulfur of higher valency states. Orig. art. has: 1 figure, 6 formulas, 9 graphs, 3 tables.

ASSOCIATION: none

SUBMITTED: 18Apr63 ENCL: 00 SUB CODE: IC, GC

NO REF SOV: 003 OTHER: 003 JPRS

Card 2/2

VLASOV, A.D., doktor tekhn. nauk (Moskva)

Eminent Soviet radiotechnologist and electronics expert; 70th birthday of Academician A.L. Mints. Priroda 54 no.1:120-121 Ja '65. (MIRA 18:2)

VLASOV, A.D.

System UO_2 - Na_2CO_3 - CO_2 - H_2O - (SiO_2) at elevated temperatures and pressures. Zhur. neorg. khim. 9 no.8:1980-1987 Ag '64. (MIRA 17:11)

VLASOV, A.P.

Organization of service given by the North Caucasian Hydrometeorological Administration to agricultural administrations. Meteor. i gidrol. no.4:40-41 Ap '63. (MIRA 16:5)

1. Severo-Kavkazskoye Upravleniye gidrometeorologicheskoy sluzhby.
(Caucasus, Northern—Hydrometeorology)(Caucasus, Northern--Agriculture)

MALIKOVA, V.F.; BATOVA, V.M., starshiy inzh.-klimatolog; MORDUKHAY-BOLTOVSKIY, D.D.; VLASOV, A.F., otv.red.; NEDOSHIVINA, T.G., red.; SERGEYEV, A.N., tekhn.red.

[Agroclimatic manual for the Kabardino-Balkar A.S.S.R.] Agroklimaticheskii spravochnik po Kabardino-Balkarskoi ASSR. Leningrad, Gidrometeor.izd-vo, 1960. 135 p. (MIRA 14:4)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye gidrometeorologicheskoy sluzhby. Severo-Kavkazskoye upravleniye. 2. Rostovskaya gidrometeorologicheskaya observatoriya (for Malikova, Batova, Mordukhay-Boltovskiy). 3. Nachal'nik otdela agrometeorologii Rostovskoy gidrometeorologicheskoy observatorii (for Malikova). 4. Nachal'nik otdela gidrologii Rostovskoy gidrometeorologicheskoy observatorii (for Mordukhay-Boltovskiy).
(Kabardino-Balkar A.S.S.R.--Crops and climate)

VLASOV, A.F.

Results achieved by hydrometeorological stations in supplying collective and state farms with agrometeorological information. Meteor. i gidrol. no.10:38-40 O '60. (MIRA 13:10)
(Meteorology, Agricultural)

VLASOV, A.F.

Increasing the flowability of molding mixtures by modified suspension. Lit.proizv. no.4:5-6 Ap '63. (MIRA 16:4)
(Sand, Foundry--Additives)

VLASOV, A.E.; GRANOVSKIY, G.I., prof., retsenzent; ROSSIYANOV, D.D., inzh., retsenzent; BROMLEY, M.F., kand. tekhn. nauk, red.; SMIRNOVA, G.V., tekhn. red.

[Removing dust and chips in machining brittle materials] Udalenie pyli i struzhki pri obrabotke khrupkikh materialov, Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 130 p. (MIRA 14:8)
(Metal cutting)

VLASOV, A.F.

AUTHORS: Vikhoreva, T.A., and Vlasov, A.F., Engineers 128-58-4-11/18

TITLE: Experience With Exothermally-Heated Feeding Heads (Opyt primeneniya pribyley s ekzotermicheskim obogrevom)

PERIODICAL: Liteynoye Proizvodstvo, 1958, No. 4, pp 25-26 (USSR)

ABSTRACT: The article gives information on a new exothermal compound for heating feeding heads of steel castings which has reduced the metal waste by 50% and also greatly reduced the number of rejects. Its composition, in weight percentage is: powder aluminum 10%, 75-percent ferrosilicon 13%, iron scale 62%, refractory clay powder 8%, fire clay 7%. Addition of 3-5% sulphite lye and 1% water is made to increase the strength of the compound in dry condition. Recommendations are given concerning the dimensions and weight of feeding heads, and the granulation of exothermal compound components. The compound is considerably cheaper than the ordinary exothermal compounds containing more aluminium powder, the burning reaction in the process of pouring is quiet, the remains of the compound partly float to the metal surface in feeding heads and form a readily removable slag. An illustration shows a casting with ordinary feeding heads and one which was exothermally

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Experience With Exothermally-Heated Feeding Heads 128-58-4-11/18

heated by using the above mentioned compound. There are 2 figures.

AVAILABLE: Library of Congress

Card 2/2 1. Steel castings-Test methods 2. Steel castings-Test results

VLASOV, A F

Tekhnika Bezopasnosti Pri Rabote na Metallorezhushchikh Stankakh (Safety Techniques for Work With Metal-cutting Machine Tools) Moskva, Mashgiz, 1951.

199 p. illus., diagrs., tables.

Literatura: P. 193- (194)

VLASOV, A. F.

VLASOV, A. F.

Tekhnika bezopastnosti pri obrabotke metallov rezaniem [Safety techniques in metal cutting]. Pod red. A. V. Pankina. Moskva. Profizdat, 1952. 72 p.

SO: Monthly List of Russian Accessions. Vol. 6 No. 7 October 1953

1. ALEKSEEV, E. G., VLASOV, A. F., GRACHEV, L. N.

2. USSR (600)

4. Lathes - Safety Appliances

7. Safety devices for lathes. Stan. i instr. 24, No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, May 1953, Unclassified.

VLasov, Aleksandr Filippovich

VLASOV, Aleksandr Filippovich; DENISOVA, I., redaktor; KIRSANOVA, N., tekhnicheskiy redaktor

[Safety engineering for metal cutting] Tekhnika bezopasnosti pri obrabotke metallov rezaniem. Izd. 2-oe [Moskva] Izd-vo VTsSPS Profizdat, 1954. 74 p. (MLRA 8:5)

(Safety engineering for metal cutting)

VLASOV, Aleksandr Filippovich; PANKIN, A.B., professor, doktor tekhnicheskikh [redacted] nauk, redaktor; DENISOVA, I.S., redaktor; RAKOV, S.I., tekhnicheskiy redaktor

[Safety techniques in high-speed metal grinding] Tekhnika bezopasnosti pri skorostnom tochenii metallov. Pod red. A.V.Pankina. [Moskva] Izd-vo VTsSPS Profizdat, 1954. 124 p. (MLRA 8:3)
(Metal industries--Safety measures)

VLASOV, Aleksandr Filippovich; VESNIKINA, A.A., redaktor; KIRSANOVA, N.A., tekhnicheskiy redaktor

[Principles of safety engineering] Osnovy tekhniki bezopasnosti. [Moskva] Izd-vo VTsSPS Profizdat, 1956. 106 p. (MLRA 10:3)
(Accidents--Prevention)

VLASOV A.F.

ZLOBINSKIY, B.M.; TRUKHANOV, A.A., doktor tekhnicheskikh nauk, professor, retsenzent; KRUKOVSKIY, V.A., dotsent, retsenzent; VLASOV, A.F., inzhener, retsenzent; VINOGRADSKIY, N.V., dotsent, redaktor.

[Elements of safety technique] Osnovy tekhniki bezopasnosti. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1954. 212 p. (MIRA 7:7)
(Industrial safety)

VLASOV, Aleksandr Filippovich; BARYKOVA, G.I., redaktor izdatel'stva;
SOKOLOVA, T.F., tekhnicheskiy redaktor

[Safety measures when operating machine tools] Tekhnika bezopasnosti pri rabote na metallorezhushchikh stankakh. Izd. 2-oe, perer. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 212 p. (MIRA 9:8)

(Machine tools--Safety appliances)

RAKITIN, G.A.; VLASOV, A.F.; GLAGOLEVA, T.A., kandidat tekhnicheskikh nauk; KOROL'KOVA, V.I., kandidat tekhnicheskikh nauk; KUZNETSOV, Ye.I.; KUCHERUK, V.V., kandidat tekhnicheskikh nauk; PROTOPOPOV, A.P.; KHOTSYANOV, L.K., professor; DUBOVA, A.B., redaktor; KIRSANOVA, N.A., tekhnicheskiy redaktor.

[Labor protection] Okhrana truda. Izd. 2-oe, isr. Moskva Izd-vo VTsSPS Profizdat, 1956. 278 p. (MLRA 9:5)

1.Moscow. Moskovskaya vysshaya shkola profdvizheniya. 2.Chlen-korrespondent Akademii meditsinskikh nauk (for Khotsyanov).
(INDUSTRIAL HYGIENE) (INDUSTRIAL SAFETY)

VLASOV, Aleksandr Filippovich; BARYKOVA, G.I., redaktor izdatel'stva;
SOKOLOVA, T.F., tekhnicheskiy redaktor

[Safety measures when operating machine tools] Tekhnika bezopasnosti pri rabote na metallorezhushchikh stankakh. Izd. 2-oe, perer. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 212 p.
(MIRA 9:8)

(Machine tools--Safety appliances)

VLASOV, Aleksandr Filippovich; DENISOVA, I.S., red.; GOLICHENKOVA, A.A., tekhn.red.

[Safety techniques in metal machining] Tekhnika bezopasnosti pri obrabotke metallov rezaniem. Izd.3., perer. Moskva, Izd-vo VTsSPS Profizdat, 1958. 92 p. (MIRA 13:1)
(Metal cutting--Safety measures)

VLASOV, Aleksandr Filippovich; DENISOVA, I.S., red.; KOROBOVA, N.D., tekhn.red.

[Fundamentals of safety engineering] Osnovy tekhniki bezopasnosti. Izd.2., perer. Moskva, Izd-vo Profizdat, 1961. 207 p. (MIRA 15:5)
(Industrial safety)

VLASOV, A.F.

Conducting agrometeorological observations from a helicopter.
Meteor. i gidrol. no.1:50-52 Ja '65. (MIRA 18:2)

1. Severo-Kavkazskoye upravleniye gidrometeorologicheskoy sluzhby.

VLASOV, Aleksey Fedorovich; GAMARNIK, Yevgeniy Yefimovich; BORIN, Ivan Sergeyevich; KONONOV, D.R., red.

[Drying foundry molds and cores by means of infrared gas burners] Sushka liteinykh form i sterzhnei gazovymi gorelkami infrakrasnogo izlucheniia. Leningrad, 1964. 20 p. (MIRA 17:11)

VLASOV, A.F.

Methods of improving the shakeout of water glass mixtures.
Lit. proizv. 5:36-38 My '64. (MIRA 18:3)

VLASOV, A.F., kand.tekhn.nauk

Pneumatic removal of chips and dust. Mashinostroitel' no.8:33-38 Ag '65. (MIRA 18:11)

VLASOV, A. G.

VLASOV, A. G. - "Natural oscillations of a straight cylinder and a rectangular parallelopiped". Leningrad, 1955. Leningrad Order of Lenin State U imeni A. A. Zhdanov. (Dissertation for the Degree of Doctor of Physicochemical Science.)

SO: Knizhnaya Letopis', No. 43, 22 October 1955. Moscow

VLASOV, A.G.

66302

24.2120 SOV/109-4-8-22/35

AUTHORS: Granovskiy, V.L., Luk'yanov, S.Yu., Spivak, G.V. and Sirotenko, I.G.

TITLE: Report on the Second All-Union Conference on Gas Electronics

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8, pp 1339 - 1358 (USSR)

ABSTRACT: The conference was organised by the Ac.Sc.USSR, the Ministry of Higher Education and Moscow State University. It was opened by the chairman of the organising committee, M.A. Leontovich, Academician. During the plenary sessions of the conference, a number of survey papers were delivered. L.A. Artsimovich read a paper on "Production of Ultra-high Temperatures in Plasma".
A survey of the optical method of measurements was given in the papers by V.A. Fabrikant and S.E. Frish.
S. Brown of the Massachusetts Institute of Technology gave a survey of the high-frequency methods of the investigation of stationary and non-stationary plasma (see p 1244 in this issue of the journal).
N.V. Fedorenko read a paper entitled "Ionisation and Inelastic Scattering During Atomic Collisions".

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L.A. Sena and Yu.M. Kagan deal with "Elementary Processes of Determining the Motion of Ions in Gas".
A paper by Ye. Sederu (Rumania) dealt with "The Role of Resonance-recharging in the Kinetics of Ions".
I.S. Stekol'nikov considered the initial stages of the development of sparks (corona-leader, main channel and the final channel).
B.N. Klyarfel'd gave a survey of the ignition processes of the discharges in highly rarified gases.
The mechanism of the breakdown of a high-vacuum gap was elucidated in a paper by V.L. Granovskiy.
L. Tonks (USA) expounded a theory of the motion of electrons in a magnetic trap (see p 1316 of this journal).
Academician R. Rompe (Eastern Germany) described a number of experiments on non-stationary plasma conducted by himself.
M. Steenbeck (Eastern Germany) gave a generalised theory of plasma. The conference was divided into six sections.
The first section was presided over by L.A. Sena and was concerned with the elementary processes in gas discharges.
The following papers were read in this section:
Ye.M. Fogel' - "Transformation of Positive Ions Into Negative Ones in Rarified Gases".
Ya. M. Fogel' with V.A. Ankudinov and D.V. Pilipenko - "Capture and Loss of Electrons During the Collision of Fast Atoms of Carbon and Hydrogen with the Molecules of Gases".
N.V. Fedorenko et al. - "Dissociation of Molecular Ions of Hydrogen During Collisions in Gas".
I.P. Flaks and Ye.S. Solov'yev - "Capture Cross-sections of Electrons in Multicharge Ions in Inert Gases".
B.M. Kushnir et al. - "Experimental Investigation of the Resonance Recharging in Certain Single-atom Gases and Metal Vapours".
O.B. Firsov - "Qualitative Investigation of Inelastic Collisions of Atoms".
L.M. Volkova - "Effective Excitation Cross-sections of the Spectral Lines of Potassium and Argon".

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I.P. Zapesochnyy and S.M. Kishko "Some Results of the Investigation of the Optical Functions of the Excitation Bands of a Negative System".
A.A. Vorob'yev and A.G. Vlasov - "Investigation of the Scattering of the Electrons in a Betatron Chamber".
The second section was presided over by B.N. Klyarfel'd and was devoted to the problems of the electrical breakdown in rarified gases and in high vacuum. The following papers were read in this section:
G.Ya. Makar-Limanov and Yu.A. Metlitskiy - "Electrostatic Control of the Ignition of Glow-discharge Tubes" (see p 1274 of the journal).
S.V. Ptitsyn et al. were concerned with the breakdown in a high-voltage mercury rectifier (see p 1278 of the journal).
L.G. Guseva "Ignition of the Discharge in Non-uniform Fields at Low Gas Pressures" (see p 1260 of the journal).
A.S. Soboleva and B.N. Klyarfel'd - "The Discharge Phenomena Between a Point and a Plane at Gas Pressures of 10^{-3} - 1 mm Hg".

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B012/B067

9.3100

AUTHORS: Vlasov, A. G., Vorob'yev, A. A., Kislov, A. N., Meshcheryakov, R. P.

TITLE: Investigation of the Losses in Electrons Due to Scattering in the Residual Gas in the Accelerating Chamber

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 8, pp. 1006-1012

TEXT: In the present paper the theoretical calculations of the losses in accelerated particles due to scattering in the residual gas were experimentally examined. A suggestion is made for calculating these losses. First, only the definite results of calculations according to the methods by N. M. Blachman and E. D. Courant (Refs. 5,6), J. M. Greenberg and T. H. Berlin (Refs. 7,8) and A. N. Matveyev (Refs. 9,10) are studied and compared in a Table. This comparison shows that the various methods lead to different results. The control method and the

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Investigation of the Losses in Electrons Due to Scattering in the Residual Gas in the Accelerating Chamber

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experimental apparatus are then described. Fig. 1 shows the measuring block diagram. The results of measurements are given and compared with the results of theoretical calculations. In conclusion the following is stated: character and quantitative comparison of the curves shown in Fig. 6 indicate that the losses in electrons due to scattering in the residual gas can be calculated according to the method of Greenberg and Berlin as well as according to that of Matveyev with sufficient accuracy since the results differ only by 1.5 ÷ 1.7 times from one another. According to the method of Blachman and Courant the losses in protons due to scattering in the gas may be estimated, whereas for the electrons the values obtained by this method are too low. The sufficient agreement between the experimental and the theoretical results also confirm the correctness of the method of measurement chosen. V. G. Shestakov assisted in the measurements. The collaborators of the NII TPI and FTF assisted the authors in this work. There are 6 figures, 1 table, and 15 references: 8 Soviet and 7 British.

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Investigation of the Losses in Electrons Due to Scattering in the Residual Gas in the Accelerating Chamber

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B012/B067

ASSOCIATION: Nauchno-issledovatel'skiy institut pri Tomskom politekhnicheskom institute im. S. M. Kirova (Scientific Research Institute at the Tomsk Polytechnical Institute imeni S. M. Kirov)

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S/139/61/000/001/002/018
E032/E514

26.2331

AUTHOR: Vlasov, A.G.

TITLE: On the Calculation of Losses of Accelerated Particles due to Scattering by the Residual Gas

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1961, No.1, pp.20-23

TEXT: N. M. Blachman and E. D. Courant (Ref.1), J. M.Greenber and T. H. Berlin (Ref.2), A. N. Matveyev (Ref.3) and others have calculated accelerated particle losses due to scattering by the residual gas in the accelerator chamber. The probability that after scattering a particle will remain in the chamber is given by

$$\Phi(\eta) = 2 \sum_{s=1}^{\infty} \frac{J_0\left(\lambda_s \frac{B_0}{b}\right)}{\lambda_s J_1(\lambda_s)} e^{-\lambda_s^2 \eta}, \qquad (1)$$

where J_0 and J_1 are the Bessel functions, λ_s is the s-th root

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of the Bessel function j_o, B_o is the initial amplitude of betatron oscillations, b is the linear dimension of the chamber in the direction under consideration and η is the factor describing multiple scattering. The particle losses are determined (in relative units) from the formula:

$$F(\eta) = 1 - \bar{\Phi}(\eta) \tag{2}$$

The above expressions take into account elastic multiple scattering only. η can be determined from the Rutherford cross-section for elastic scattering, obtained taking the Born approximation into account. E. D. Courant (Ref.6) has shown that the use of the Born approximation may lead to an over-estimation of the cross-section and has used the elastic cross-section obtained by G. Moliere (Ref.7) to calculate η. Moreover, Courant has replaced the maximum scattering angle θ_{max} by θ_1, which is given by

$$\theta_1 = \frac{b\sqrt{\varkappa}}{R_o(1+\alpha)^{1/2}} \tag{3}$$

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In this expression $\varkappa = n$ for axial oscillations and $\varkappa = 1 - n$ for radial oscillations, where n is the magnetic field index, R_o is the radius of the equilibrium orbit in centimetres and $\alpha = L/2\pi R_o$ and is the ratio of the length of the straight line sections to the length of the curvilinear sections. The expression for η then reads

$$\eta_1 = \frac{\pi^2 N R_0^3 Z^2 e^4 (1+\alpha)^2}{4\varkappa b^2 T_i e V}\left[\ln\frac{\Theta_1^2}{\psi_{\varphi_1}^2} - 1\right], \qquad (4)$$

where $\psi_{\varphi_1} = 1.2\ \theta_{min}\ (1 + 3.33\ \varphi_1^2)^{1/2}$; $\varphi_1 = \frac{Z}{137\ \beta}$; θ_{min} is the minimum scattering angle, N is the number of atoms per cc in the chamber, T_i is the injection energy in eV, Z is the atomic number of the residual gas and eV is the energy communicated to the particle per revolution in electron volts. The present author points out that the use of the Moliere (Ref.7) cross-section complicates the

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matter very considerably. For this reason the present author has used the cross-section obtained by Mott (Refs. 9 and 10) on the basis of the Thomas-Fermi statistical model. On this approach, η is given by

$$\eta_2 = \frac{\pi^2 N R_o^3 Z^2 e^4 (1+\alpha)^2}{2\varkappa b^2 T_i e V} \ln \frac{\theta_1}{\theta_{min}} \tag{6}$$

Numerical calculations have shown that the values of η calculated from Eq.(6) differ by only 3 to 5% from those obtained from Courant's formula (Eq.4). On the other hand, calculations based on Eq.(6) are very much simpler. It follows that in order to calculate particle losses by the Blachman-Courant method, it is convenient to use the cross-section obtained by Mott and to calculate η from Eq.(6). The present author reports detailed numerical data for particle losses in the following accelerators: proton-synchrotron of the Joint Institute for Nuclear Studies (Dubna, USSR), the cosmotron (Brookhaven, USA), proton-synchrotron of the Birmingham University, synchrotron of the California

89694

S/139/61/000/001/002/018
E032/E514

On the Calculation of Losses.....

University (Pasadena, USA), Berkeley synchrotron (USA), and the betatron of the Tomsk Scientific Research Institute (USSR). It is shown that losses due to radial oscillations in electron accelerators are comparable with those due to axial oscillations, while for proton accelerators they are considerably smaller, since the radial dimension of the chamber in the case of proton accelerators is 3 to 4 times larger than the vertical dimension. It is essential to take into account radial oscillations in the case of the electron accelerators. The pressure in the vacuum chamber should normally be chosen so that particle losses due to scattering by residual gas should not exceed 10 to 15%. The total losses calculated by the Blachman-Courant method, modified as indicated above, differ from the experimental results by not more than 30%. It follows that for engineering purposes the above method is quite adequate. Acknowledgments are expressed to Doctor Professor A. A. Vorob'yev for discussions and valuable advice. There are 2 tables and 11 references: 4 Soviet, 7 non-Soviet.

ASSOCIATION: NII pri Tomskom politekhnicheskom institute imeni S.M.Kirova (Scientific Research Institute of the Tomsk Polytechnical Institute imeni S. M. Kirov)

Card 5/6

89694

On the Calculation of Losses..... S/139/61/000/001/002/018
E032/E514

SUBMITTED: February 15, 1960

Card 6/6

22784

S/057/61/031/005/015/020
B104/B205

21.2000

AUTHOR: Vlasov, A. G.

TITLE: Effect of pressure in a vacuum chamber on the radiation intensity of accelerators

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 5, 1961, 613-615

TEXT: Experiments with a betatron having a radiant energy of 15-25 Mev, performed at the Tomskiy politekhnicheskiy institut (Tomsk Polytechnic Institute), have shown that, at pressures of $(1 - 2)\cdot10^{-5}$ mm Hg, emission is virtually lacking, intensity increases considerably with a pressure drop to $(3 - 5)\cdot10^{-6}$ mm Hg, and that intensity does not increase very much with further decrease of pressure. The parameters of the accelerator are listed in the accompanying table. For a smooth operation of the accelerator, a pressure of $(2 - 4)\cdot10^{-6}$ mm Hg is required; further improvement of the vacuum is superfluous. An increase of the injection energy raises the radiation intensity at one and the same pressure. The loss of electrons due to scattering by molecules and atoms of the residual gas in the chamber of the betatron at 15-25 Mev was calculated.

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S/057/61/031/005/015/020
B104/B205

Effect of pressure in a...

The methods of calculation, originally intended for the calculation of proton losses, were taken from a paper by Blachman et al. (Phys.Rev., 74, 140, 1948; 75, 305, 1949). In calculating the electron losses the author had to take account of both elastic and inelastic collisions. Furthermore, radial and axial oscillations have been considered. Theoretical and experimental values are intercompared in Fig. 2 and were found to be in good agreement. Summing up, it is noted that every accelerator exhibits a critical pressure at which its emission will vanish. It is advisable to evacuate the chamber of the accelerator down to a certain pressure limit, since a lower vacuum would be useless. For the betatron in question, this value is $(2 - 3)\cdot 10^{-6}$ mm Hg. The theoretically calculated losses amount to 6-8% but the experimental ones are somewhat higher. This is due to factors that have not been taken into account, such as disturbances of the magnetic field, initial spread on injection, etc. Doctor A. A. Vorob'yev is thanked for a discussion, and Engineers R. P. Meshcheryakov and G. M. Tsyb for assistance in experiments. There are 2 figures, 1 table, and 12 references: 5 Soviet-bloc and 7 non-Soviet-bloc. The two references to English-language publications read as follows: E. Courant, Rev.Sci.Instr., 24, 836, 1953;

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S/057/61/031/005/015/020
B104/B205

Effect of pressure in a...

Mullett, L.B., A.E.R. E., GP/R, 2072, 1959.

SUBMITTED: May 26, 1960

Legend to Fig. 2: Theoretical dependence of electron losses on scattering by the residual gas in the chamber of the betatron.

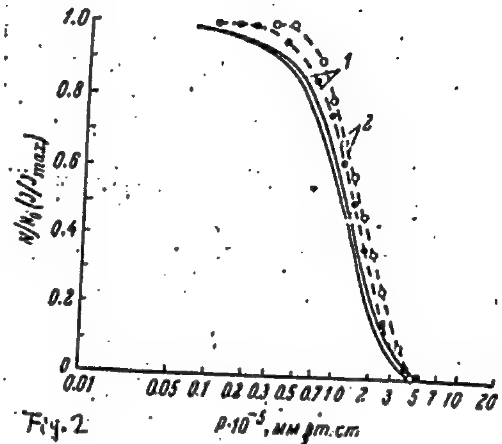

Fig.2

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VLASOV, A.G.; PONOMAREV, V.P.; SHIVYRTALOV, M.T.; SHCHENIN, P.M.

Vacuum systems for electron accelerators. Izv. TPI 122:99-107 '62. (MIRA 17:9)

VLASOV, A.G.; SHERSTYUK, A.I.

Theoretical investigation of the possibility of applying the method of differential thermal analysis to the quantitative study of the crystallization process. Stekloobr. sost. no.1:116-119 '63.
(MIRA 17:10)

S/058/63/000/001/013/120
A062/A101

AUTHOR: Vlasov, A. G., Kislov, A. N., Meshcheryakov, R. P.

TITLE: Apparatus for measuring short-life isometric transitions

PERIODICAL: Referativnyy zhurnal, Fizika, no. 1, 1963, 37, abstract 1A353 (In collection: "Elektron. uskoriteli", Tomsk, Tomskiy un-t, 1961, 288 - 291)

TEXT: Apparatus for measuring short-life isometric transitions is described. The measurements were carried out on a betatron of 25 MeV maximum energy. The apparatus comprised a cutting-off circuit which permitted also the control of the maximum energy of bremsstrahlung and the prevention of the error due to oscillations of the radiation intensity, a scintillation spectrometer operating with a pulse supply, an amplitude analyzer and a 16-channel time analyzer. The duration of the cut-off was 3 μsec.

K. Aglintsev

[Abstracter's note: Complete translation]

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L 57830-65 EPA(w)-2/EWT(m)/EWP(b)/EWA(m)-2/EWP(t) Pt-7/Pab-10 IJP(c)

ACCESSION NR: AR404940 S/0275/64/000/009/A003/A010
521.527

SOURCE: Ref. zh. Elektronika i yeye primeneniye. Svodnyy tom, Abs. 9A46

AUTHOR: Vlasov, A. G.; Ponomarev, V. P.

19

TITLE: Using the titanium pumps for exhausting betatron chambers

CITED SOURCE: Sb. Elektron. uskoriteli. M., Vyssh. shkola, 1964, 386-39?

TOPIC TAGS: titanium pump, high vacuum pump, betatron chamber

TRANSLATION: The widely-used method of obtaining high vacuum in the betatron acceleration chamber by continuous operation of a diffusion pump [illegible]

[illegible] ... and ... used for exhausting betatron ... [illegible]

... is exhausted by a rough-vacuum pump succeeded by a special

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L 57830-65

ACCESSION NR: AR4049406

starter that consists of a tungsten 0.5-mm wire around which a titanium current-carrying wire is wound; the starter reduces the pressure from 10^{-2} torr to [illegible] The pump parameters are: cathode current, 12--15 [illegible]; collector current, 80--100 ma [illegible] collector voltage, 1200 v, minimum [illegible] cathode voltage, 1--6 v; [illegible] sec at [illegible] torr. The seals between [illegible] $\times 10^{-8}$ [illegible] rate, [illegible] the detachable units are made of [illegible] plastic. This pump permitted to attain a [illegible] in the ceramic chamber of a 25-Mev betatron. A titanium pump [illegible] diagram, a [illegible]-sealed betatron chamber, and a [illegible] diagram for measuring gas rate and chamber in leakage are presented. Bibliography: 9 titles.

SUB CODE: NP

ENCL: 00

Card 2/2

VLASOV, A.G.; KRUPP, D.M.

Recurrence form of Seidel sums expressing the dependence of aberrations on the position of the pupil of an aspherical objective. Opt. i spektr. 18 no.3:501-504 Mr '65.

(MIRA 18:5)

VLASOV, A. G.

[illegible] 3704

A Magnetic Lens with Minimum Spherical Aberration A. G. Vlasov (*Bull. Acad. Sci. U.R.S.S., sér. phys.*, 1944, Vol. 8, No. 5, pp. [illegible]. In Russian.) The spherical aberration of a magnetic lens is considered, and a formula (1) for calculating it is given. Methods are indicated for deriving conditions under which spherical aberration would be a minimum. The case of a "short" magnetic lens is discussed in greater detail and the shape of the pole shoes satisfying the required conditions is determined.

An abstract in English was noted in [illegible] July

621.385.833 3706

Calculation of the Fields of Simple Electrostatic Lenses. A. G. Vlasov. (*Bull. Acad. Sci. U.R.S.S., sér. phys.*, 1944, Vol. 8, No. 5, pp. 240-242. In Russian.) Lenses are considered which represent systems of (a) a number of plane metallic electrodes perpendicular to the optical axis, and having circular apertures with their centres on the optical axis, and (b) a number of cylindrical surfaces with their axes coinciding with the optical axis. A function is found satisfying Laplace's equation within the space bounded by the electrodes, and passing through given values at the electrodes. It is shown that the problem can be reduced to that of Dirichlet for the case of a cylinder, and, starting from Laplace's equation, a solution (10) is found which satisfies all conditions of Dirichlet's problem. An abstract in English was noted in 1945 of July [illegible]

VLASOV, A.

"Calculation of Fields of the Simplest Electrostatis Lenses" and "A Short Magnetic Lens with a Minimum Spherical Aberration," both abstracts of papers of the Acad. Sci., USSR. Published in J. Phys., USSR, 1945, Vol 9, No 1, p 60.

SO: Wirless Engineer, Vol 23, No 274, Jul 46

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Q

3934. INFLUENCE OF ELECTRODE PRECIPITATION ON OPERATION OF ELECTRICAL PRECIPITATORS. Vlasov, A. and Kaptsov, N. (J. Tekhn. Fiz., Nov. 1947, vol. 17, 1371-1380). Experimental investigations have shown that a layer of non-conducting particles on the electrode of a precipitator distorts the field distribution in the corona zone. Measurements indicate that the outer corona layer is charged to a certain potential, depending on the properties of the precipitate, thickness of the layer and corona current. The tests were carried out with reference to negative corona discharge.

E.R.A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PHASE I BOOK EXPLOITATION SOV/5035

Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 3d, Leningrad, 1959.

Stekloobraznoye sostoyaniye; trudy Tret'yego vsesoyuznogo soveshchaniya Leningrad, 16-20 noyabrya 1959 (Vitreous State; Transactions of the Third All-Union Conference on the Vitreous State, Held in Leningrad on November 16-20, 1959) Moscow, Izd-vo AN SSSR, 1960. 534 p. Errata slip inserted. 3,200 copies printed. (Series: Its: Trudy)

Sponsoring Agencies: Institut khimii silikatov Akademii nauk SSSR. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleyeva and Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova.

Editorial Board: A.I. Avgustinik, V.P. Barzakovskiy, M.A. Bezborodov, O.K. Botvinkin, V.V.Vargin, A.G. Vlasov, K.S. Yevstrop'yev, A.A. Lebedev, M.A. Matveyev, V.S. Molchanov, R.L. Myuller, Ye.A. Poray-Koshits, Chairman, N.A. Toropov, V.A. Florinskaya, A.K. Yakhkind; Ed. of Publishing House: I.V. Suvorov; Tech. Ed.: V.T. Bochever.

PURPOSE: This book is intended for researchers in the science and technology of glasses.

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Vitreous State (Cont.) SOV/5035

COVERAGE: The book contains the reports and discussions of the Third All-Union Conference on the Vitreous State, held in Leningrad on November 16-19, 1959. They deal with the methods and results of studying the structure of glasses, the relation between the structure and properties of glasses, the nature of the chemical bond and glass structure, and the crystallochemistry of glass. Fused silica, mechanism of vitrification, optical properties and glass structure, and the electrical properties of glasses are also discussed. A number of the reports deal with the dependence of glass properties on composition, the tinting of glasses and radiation effects, and mechanical, technical, and chemical properties of glasses. Other papers treat glass semiconductors and soda borosilicate glasses. The Conference was attended by more than 300 delegates from Soviet and East German scientific organizations. Among the participants in the discussions were N.V. Solomin, Ye. V. Kuvshinskiy, Yu.A. Gastev, V.P. Pryanishnikov, Yu. Ya. Gotlib, O.P. Mchedlov-Petrosyan, G.P. Mikhaylov, S.M. Petrov, A.N. Lazarev, D.I. Levin, A.V. Shatilov, N.T. Ploshchinskiy, A.Ya. Kuznetsov, E.V. Degtyareva, G.V. Byurganovskaya, A.A. Kalenov, M.M. Skornyakov, P.Ya. Bokin, E.K. Keller, Ya.A. Kuznetsov, V.P. Pozdnev, R.S. Shevelevich, Z.G. Pinsker, and O.S. Molchanova. The final session of the Conference was addressed by Professor I.I. Kitaygorodskiy, Honored Scientist and Engineer, Doctor of Technical Sciences. The following

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institutes were cited for their contribution to the development of glass science and technology: Gosudarstvennyy opticheskiy institut (State Optical Institute), Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, AS USSR), Fizicheskiy institut AN SSSR (Physics Institute AS USSR), Fiziko-tekhnicheskiy institut AN SSSR (Physicotechnical Institute AS USSR), Institut fiziki AN BSSR, Minsk (Institute of Physics, Academy of Sciences, Belorusskaya SSR, Minsk), Laboratory of Physical Chemistry of Silicates of the Institut obshchey i neorganicheskoy khimii AN BSSR, Minsk (Institute of General and Inorganic Chemistry, Academy of Sciences, Belorusskaya SSR, Minsk), Institut vysokomolekulyarnykh soyedineniy AN SSSR(Institute of High Molecular Compounds, AS USSR), Gosudarstvennyy institut stekla (State Institute for Glass), Gosudarstvennyy institut steklovolokna (State Institute for Glass Fibers), Gosudarstvennyy institut elektrotekhnicheskogo stekla (State Institute for Electrical Glass), Sibirskiy fiziko-technicheskiy institut, Tomsk (Siberian Physicotechnical Institute, Tomsk),Leningradskiy gosudarstvennyy universitet (Leningrad State University), Moskovskiy khimiko-tekhnologicheskiy institut (Moscow Institute of Chemical Technology),Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institut imeni Lensovet), Belorusskiy politekhnicheskiy institut Minsk (Belorussian Polytechnic Institute, Minsk), Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute), and Sverdlovskiy politekhnicheskiy institut (Sverdlovsk

Polytechnic Institute). The Conference was sponsored by the Institute of Silicate Chemistry AS USSR (Acting Director - A.S. Gotlib), the Vsesoyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva (All-Union Chemical Society imeni D.I. Mendeleyev), and the Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova (State "Order of Lenin" Optical Institute imeni S.I. Vavilov). The 15 resolutions of the Conference include recommendations to organize a Center for the purpose of coordinating the research on glass, to publish a new periodical under the title "Fizika i khimiya stekla" (Physics and Chemistry of Glass), and to join the International Committee on Glass. The Conference thanks A.A. Lebedev, Academician, Professor, and Chairman of the Organization of Committee; Ye.A. Poray-Koshits, Doctor of Physics and Mathematics, Member of the Organizational Committee; and R.L. Myuller, Doctor of Chemical Sciences, Member of the Organizational Committee. The editorial board thanks G.M. Bartenev, M.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.K. Dubrovo, V.A. Ioffe, and B.T. Kolomiyets. References accompany individual reports.

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On the State and on the Further Tasks Connected With the Solution of Glass Structure Problems (Resolution of the Third All-Union Conference Held During November 16-21, 1959) 528

AVAILABLE: Library of Congress

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JA/dwm/gmp
6-29-61

Vlasov, A. G.

15(2)

AUTHOR: None Given SOV/72-59-5-1/23

TITLE: Glass Science at the VIII Mendeleyev Congress (Nauka o stekle na VIII Mendeleyevskom s"yezde)

PERIODICAL: Steklo i keramika, 1959, Nr 5, pp 1-4 (USSR)

ABSTRACT: In the beginning a proclamation of the TsK KPSS to the personnel of the building material industries for a qualitative and quantitative increase of production is mentioned. The Congress took place in Moscow in the second half of March of the current year and was devoted to the 125th anniversary of the great scholar's birthday. Outstanding chemists of the Soviet Union and the People's Democracies attended the Congress. The principal problems of the development of chemistry were discussed at the plenary meetings and the meetings of the 18 Congress sections. Professor I. I. Kitaygorodskiy opened the meetings of the sub-section for glass and gave a survey of the stages of development of Soviet glass production as well as of a number of promising tasks in the field of glass technology. Moreover, the following lectures were held: Doctor Korani (People's Republic of Hungary) investigated the structure of the top-layers of glass;

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A. I. Avgustinnik (LTI imeni Lensovet) discussed the formation of a finely disperse crystalline phase from the glass-like phase; V. V. Vargin and G. O. Karapetyan (GOI) reported on absorption spectra, luminiscence, and photochemical properties of cerium-glass types; A. G. Vlasov (GOI) reported on the quantitative reciprocal relations between ordered and disordered glass phases; Ye. A. Poray-Koshits, Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry of the AS USSR) discussed the reasons for the disagreement on the problem of the structure of glass-like substances; Professor O. K. Botvinkin, N. I. Ananich, and M. L. Mironova, Institut stekla (Glass Institute) reported on the Investigation of the Glass Structure by the Method of Thermal Analysis and Optical Polarization; Ye. V. Podushko (GOI) discussed the new method of electric glass melting and the melting of silicates by means of high-frequency current; Yu. G. Shteynberg reported on strontium-magnesium glases without lead and boron for faience and majolica which have been developed in the Gosudarstvennyy nauchno-issledovatel'skiy keramicheskiy institut (State Scientific Research Institute of Ceramics); L. S. Yastrebova, and V. S. Molchanov (GOI) discussed the role played by the

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surface protection film in the destruction of silicate glasses; G. I. Veynberg (GOI) discussed the coloring characteristics and the technology of phosphate glasses; O. V. Mazurin (LTI) reported on the mobility of sodium ions in glass types of the system Na_2O-RO-SiO_2; Z. A. Nosova (NII Stroykeramika) discussed the process of subduing the glases by lead oxide and zirconium; L. G. Mel'nichenko, Khar'kovskiy politekhnicheskiy institut (Khar'kov Polytechnic Institute) reported on silicate formation and sintering processes in the ... glass layer; K. M. Yevstrop'yev investigated various types of glass; N. N. Semenov (Glass Institute) reported on the determination of impurities in silica by spectroscopic analysis; G. S. Bogdanova, and Ye. M. Orlova (Glass Institute) reported on types of electrode glass which has been devised by them. Yu. V. Rogoshin (Glass Institute) discussed the kinetics of the formation of crystallization centers in photo-sensitive types of glass; Z. M. Syritskaya (Glass Institute) discussed the results of the investigation of the tendency of phosphatic systems towards glass formation; L. A. Grechanik, N. V. Petrovykh, and V. G. Karpechenko (NIIES) reported on the investigation of types of semiconducting oxide glass on the basis of V_2O_5; N. V. Solomin, L. A. Grechanik, I. V. Shpakova, and Ye. A. Faynberg (NIIES) discussed the production of conductive films on types of glass which contain components easily to be regenerated.

Vlasov, A. G.

VLASOV A.G.

AUTHOR: Syritskaya, Z. M.

S/072/60/000/03/021/023
B003/B008

TITLE: 3rd All-Union Conference on the Vitreous State

PERIODICAL: Steklo i keramika, 1960, Nr 3, pp 43-46 (USSR)

ABSTRACT: The 3rd All-Union Conference on the Vitreous State was held in Leningrad at the end of 1959. It was organized by the Institut khimii silikatov AN SSSR (Institute of the Chemistry of Silicates AS USSR), Vsesoyuznoye khimicheskoye obshchestvo imeni D. I. Mendeleyeva (All-Union Chemical Society imeni D. I. Mendeleyev) and Gosudarstvennyy opticheskiy institut imeni S. I. Vavilova (State Optical Institute imeni S. I. Vavilov). More than 100 reports on the structure of glass, investigation methods of the vitreous state, the mechanism of vitrification and physicochemical and technical properties of glasses were delivered. The Conference was opened by Academician A. A. Lebedev. Fundamental investigation methods and results concerning the glass structure were discussed at the 1st meeting. Academician A. A. Lebedev reported on possibilities and results of optical methods, Ye. A. Poray-Koshits on the diffraction method, K. S. Yevstrop'yev on general problems concerning structure and properties of glasses. The 2nd meeting produced 5 reports on the problem of the vitreous state: R. L. Muller, "Chemical Peculiarities of Polymeric Vitreous Materials and the

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Nature of Vitrification"; N. A. Goryunova and B. T. Kolomiyets, "On the Problems of Conformities of the Vitrification"; [illegible], "Glass as a Polymer"; A. N. Dauval'ter, "Theory of Glass Structure"; A. G. Vlasov, "Natural Oscillations of the Glass Lattice". The 3rd meeting produced 9 reports on investigation results of silicate melts and on problems of the mechanism of vitrification: A. I. Avgustinik, "On the Problem of the Formation of the Crystalline Phase From the Silicate Melt"; O. K. Botvinkin, "Process of Vitrification and the Structure of Glass"; B. M. Lepinskikh, O. A. Yesin and V. I. Musikhin, "On the Structure of Melts"; I. T. Sryvalin and O. A. Yesin, "Thermodynamic Properties of the Silicate Systems $FeO - CaO - SiO_2$ and $CaO - Al_2O_3 - SiO_2$"; G. M. Bartenev, "Mechanical and Structural Vitrification"; M. V. Vol'kenshteyn, "Mechanism of Vitrification". At the 4th meeting, 13 reports dealt with problems of the glass structure and optical investigation methods: V. A. Florinskaya, "Infrared Reflection Spectra of Sodium Silicate Glasses and Their Relations to the Structure"; Ya. S. Bobovich and T. P. Tulub, "Smekal-Raman Dispersion of Light and the Structure of Some Silicate Glasses"; V. A. Kolesova, "Investigation of the Vibrational Spectra of Aluminosilicate Glasses"; N. N. Sobolev reported on the work of the Fizicheskiy Institut AN SSSR (Institute of Physics AS USSR) with

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glasses from one component, with the help of infrared spectrophotometry and the Smekal-Raman dispersion; T. A. Sidorov reported on the molecular structure and the properties of the crystalline quartz; S. N. Brekhovskikh and V. P. Cheremisinov reported on structural investigations of lead- and bismuthborate glasses with the aid of infrared spectroscopy; A. G. Vlasov, "The Quantitative Relation of the Orderly and Irregular Phase in Glass"; G. O. Barlyk'yants and A. G. Alekseyev, "Electronographic Investigation of the Structure of Glasses"; N. A. Voyshvillo, "On the Structure of a Sodium-boron-silicate Glass Submitted to Enduring Thermal Treatment"; N. S. Andreyev, V. I. Aver'yanov, N. A. Voyshvillo, "Structural Interpretation of the Anormal Dispersion of the Visible Light in Sodium-boron-silicate Glasses". At the 5th meeting, 9 reports dealt with the investigation results of sodium-boron-silicate glasses. A. A. Appen and Can' Fu-Si, "Boron and Aluminoboron Anomaly of the Properties of Silicate Glasses"; Ye. I. Galant, "On the Coordination Numbers of Aluminum and Boron in Some Glasses"; S. P. Zhdanov reported on structural changes in boron-silicate glasses; Ye. A. Poray-Koshits and S. P. Zhdanov reported on some controversial problems concerning the structure of boron-silicate glasses and their porous products; Ye. A. Poray-Koshits and N. S. Andreyev, "Submicroscopic Inhomogeneities in the Structure of Complex Glasses". The 15 reports at

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(23)

VLASOV, A.G., dots.; MINKEV, I.M., inzh.

Determining the electric field in a dielectric in connection with high-frequency heating. Izv.vys.ucheb.zav.; energ. 3 no.3:47-55 Mr '60. (MIRA 13:3)

1. Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I.Vavilova.
(Dielectrics) (Induction heating)

VLASOV, A.G.; KRUPP, D.M.

Calculating the fields of electron lenses. Izv.AN SSSR.Ser.fiz. 25 no.6:662-664 Je '61. (MIRA 14:6)
(Electron optics)

39870

S/051/62/015/002/009/014
E032/E314

24.3300

AUTHORS: Yermolayev, A.M., Minkov, I.M. and Vlasov, A.G.

TITLE: A method of calculation of the optical properties of a multilayer coating with a given reflecting power

PERIODICAL: Optika i spektroskopiya, v. 13, no. 2, 1962, 259 - 265

TEXT: The authors consider the design of an n-layer coating with a given reflecting power R_N, where

$$R_N = R_N (x_o, x_1, \dots x_N, x_{N+1}, \vartheta, \lambda) \tag{1}$$

x_j are the optical parameters of the media,
ϑ is the angle of incidence, and
λ the wavelength.

It is required to determine the number of layers N and the magnitude of the parameters x_j for which the reflecting power

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A method of ....

S/051/62/015/002/009/014
E032/E314

$R_N(\lambda)$ in the given wavelength interval and for a given angle of incidence should be described by a given function

$$R_N(x_1, x_2, \ldots x_N, \lambda) = F_o(\lambda) \qquad (2) .$$

The calculation starts with an assumed approximately known function $F_o(\lambda)$, which is denoted by R_m and contains the arbitrary parameters x_j. The next approximation is obtained by considering the quantities Φ_m, $m = m_o, m_o + 1, \ldots,$ which are given by:

$$\Phi_m(\underline{X}) = \int_{\lambda_1}^{\lambda_2} \rho(\lambda) \left| R_m(\underline{X}, \lambda) - F_o(\lambda) \right|^k d\lambda, \; k > 0 \qquad (3) .$$

In this formula $\rho(\lambda) > 0$ is a weighting function, $\underline{X}$ is a vector whose cartesian coordinates are

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